

# AVIATION WEEK

SEP. 27, 1948

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Illustration above shows *L-M-Bartow* controllable beam high intensity lighting on main NE-SW runway at Lambert Field, St. Louis, seen from about 200 feet. The runway is 5200 by 200 feet. Breaks at upper left and right are taxiways. Range lights across ends are *L-M-Bartow* units with standard green color screens.



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AVIATION WEEK, September 27, 1948



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Vol. 48, No. 13

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AVIATION WEEK, September 27, 1968

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## NEWS SIDELIGHTS

### CAA Reorganization

CAA Administrator Ed Reardon is a busy man. Last week he was named director of the first part of its task, filed by the city of Dallas in New Orleans U. S. Circuit Court of Appeals, to prevent CAA from allocating federal funds to Mather Airport, subject of a long continued feud between the cities of Dallas and Ft. Worth.

The move while the administration was also deeply involved in details of the proposed CAA reorganization. He sent a substitute, Deputy George Rogers, to fill his speaking engagement at Vancouver, B. C., in order to give more attention to home shuffling.

The task looks more difficult now than it did in early stages. Unofficial word at CAA is that the number of tentative reorganization charts that have already been drawn up and scrapped would probably paper over well of the administrator's office. No final word on reorganization at CAA is likely for at least another week.

### House Labor Probe

House investigation of the pilot strike against National Airlines has nothing to do with settling the eight-month-old feud between Rep. Paul A. Hartley, chairman of the House Labor Committee, admitted that fact after he sat in a one-hour subcommittee last week and heard National's side of the story from President G. T. Bailey and two NAL attorneys.

Hartley said he is simply gathering information on what happened for whatever use it might be in considering changes in the Taft-Hartley or Railway Labor Act.

At Hartley's request, Thomas E. Shriver and David MacDonald of the Taft-Hartley "watchdog" committee sat in on the hearing. The New Jersey congressman thinks perhaps the argument should be taken down from the Railway Labor Act and put under the Taft-Hartley law. But he is not taking issue at the end of the story, and shows a little sympathy for such a move.

### Merger Still Cooking

Industry associates who broke off the Eastern Northrup merger as a "dead duck" may be wrong. Merger discussions are still under way between top brass of both companies. Final agreement as the merger is by no means certain but the prospects are far from dead.

### ALPA Fencing

The Air Line Pilots Association has been doing considerable fencing in the clouds as the scheduled strike against National nears its way. Some wing during the recent Air Force Day celebration in Washington and during the inauguration at NAL's service in New York's International (JFK) Airport published the wildest scenarios.

In addition, ALPA accused the last's wisdom of Major for Capt. Aaron L. (Jaggy) Johnson, a two-time NAL pilot who won the Thompson trophy in last P-51 Mustang at the recent Cleveland Air Races.

ALPA has attempted to retard such company projects in opposing of new ticket offers by inducing union construction labor to leave the job on the ground that NAL is "bad." In one instance the striking pilots drew a monkey-wrench at a theater show's curtain for a free trip to Havana via National.

Latest incident along this line is National's charge that ALPA had a secret insurance company subterfuge business by increasing the potential cost of the regular pilots were out on strike.

### Transport Problem

Lack of new transports in the fiscal 1959 USAF and Navy fiscal programs has spent some manufacturers. Only transports included in the program are the tactical type Fairchild C-119 and Northrop C-125 plus 18 Douglas C-124s, a 50,000-lb. payload strategic transport.

Some planners in both USAF and Navy's Staffs feel that in shipping of transports in favor of virtually all combat plane services are again killing victims to the "numbers racket" but anguish both logistical support and a high degree of adequate training for personnel.

Expenditure during the last year indicated that more than 100 aircraft without the other two became more reorganizing in combat. Provision that the fiscal 1958 budget will do better by transports have been made unofficially to another similar manufacturing.

### James Takes His Stand

CAR member Harold A. Jones' strident dissent from the majority board opinion which authorized flight instructor operations and his pointed questioning during recent staff argument at the air flight school proceeding have the all cargo lines worried. Some officials among the flight carrier now believe their chances for confirmation today as Vice Chairman Oswald Ryan.

They measure CAR Chairman O'Connor and member Jack Lee in the most likely to support their route application. A CAR opinion denying all flight school operations would be a death blow to some airlines.

### LeMay for Kenney

Despite the emphasis with which the Pentagon politicians favored last month of Strategic Air Command post Gen. George Kenney is not expected to return. Now that Louis G. Cole, Eisenhower LeMay, now USAF commander in Europe, had been given Kenney's job since a surprise and shock in Kenney and SAC personnel.

Kenney sold now hand the Air Unit status of Maxwell Field and if he can reach only 10 percent of what he knows about as well to the USAF strategic program, the transports will be getting more than their money's worth. Kenney's least achievement in more than 18 years of distinguished service was building up SAC from practically nothing to the only part of the USAF now capable of combat in less than 10 hours notice.

### Security Note

U. S. Air Force's successful in a new world speed record was supposed to be a carefully guarded military secret as the Gen. Hoyt Vandenberg, USAF chief of staff, could make an exclusive release on the event. An Air Force press release scheduled for 2:30 p.m. Saturday, Sept. 18. Maj. Johnnie at the moment on Wednesday morning Sept. 18 at Miami.

Only two high ranking USAF officers outside the confines of Miami were supposed to know of the event. At the Air Force Day dinner in Washington Friday night, Sept. 17, news of the C-70 night record was blowing all over the Berlin Hotel. Saturday morning Washington Post's James Norris, who attended the dinner, copied Vandenberg's speech which he put out last Sunday morning 34 hours later.

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## AVIATION CALENDAR

Oct. 8-9—National Association of State Aeronautics Officers, Crystal Palace, Boston  
Oct. 8-9—Society of Automotive Engineers symposium meeting, Hyattsville Hotel, Los Angeles  
Oct. 9-10—Veeva Radio Fair, Berkeley, Calif.

Oct. 10—Annual Air Line Operations Association symposium, Hollywood Ritz Hotel, Chicago, Ill.

Oct. 10-18—International aircraft meeting, Royal Institute Aeronautical Society, Dordrecht

Oct. 12-13—National Aviation Club Tea

Oct. 13—ATA general council meeting, London

Oct. 13-15—American Society of Travel Agents, Houston, Tex.

Oct. 14-15—National Safety Council Air Transportation Section, Hotel Statler, Chicago

Oct. 15-15—Society of Automotive Engineers symposium meeting, Statler Hotel, Cleveland

Oct. 16-18—AASD Airline Aviation Conference, sponsored by Director of Commerce, Princeton

Oct. 16-18—Motor Flying Pattern convention, Long Beach, Calif.

Oct. 18-19—ATAA Aviation Defense Association Conference, Pacific Telephone, Los Angeles, Calif.

Oct. 18-19—Society of Automotive Engineers symposium meeting, transportation and maintenance meeting, Engineering Institute, New York City

Oct. 18-19—Society of Automotive Engineers, laws and technical meeting, Main Hotel, Tulsa, Okla.

Nov. 1—International Society for Testing Materials symposium meeting and technical study, Eureka Hotel, Chicago

Nov. 1-11—ATAA Airlines, Dealers and Manufacturers Assn., 19th annual meeting, Hotel Statler, Cleveland

Nov. 1-11—National Aviation Service Assn., annual meeting, Statler Hotel, Cleveland

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## DOMESTIC

A North American B-45 fourjet tactical bomber expanded and crashed near Alameda, Calif., killing test pilot George W. Koehn and Navigator G. Ireland. The explosion was heard for miles and the wreckage scattered over four miles. This is the first serious accident to the B-45, which has been in production since early this year. A total of 170 is on order.

President Truman has appointed Donald J. Carpenter, vice president of Remington Arms Co., to be chairman of the Munitions Board. Carpenter previously acted as chairman of the military loan committee of the Atlantic Energy Commission. He replaces Thomas J. Higgins who resigned.

Fortress of B-29 bombers completed their assigned long-distance flights from Alaska bases in more U. S. cities in celebration of Air Force Day. Nine of the planes landed at their destination on the exact minute scheduled and none were more than one hour late. The doubled B-29 landed safely in Alaska on a projected Japan-Minneapolis flight.

All American Aviation's stockholders could last week to change the company's name to All American Airways, Inc., to identify carrier's activities "more appropriately" with its transport operation.

## FINANCIAL

Boeing Aircraft Corp. declared a dividend of \$1 per share payable Oct. 17 to holders of record Oct. 1. President Walter Bechler expects earnings in year ending Sept. 30 to equal \$2.90 per share on the 400,000 outstanding shares of common stock.

Continental Marine Corp. reports for nine months ending July 31 profit of \$1,135,123 on sales of \$35,902,660.

## FOREIGN

Skandinavisk Airlines, Inc. has received a temporary permit from El Salvador to operate cargo flights between that country and Houston, Tex. and New Orleans, La. The scheduled cargo carrier uses two Douglas C-124 transports and has already completed four flights over the routes carrying such diversified cargo as livestock and small automobiles.

Peru has cancelled the reputation of its aircraft of Peruvian Airlines for alleged drug operations in Palermo. The planes were said to have been based in Cuba.

## INDUSTRY OBSERVER

Chase Vought Division of United Aircraft Corp. is making its new Navy fighter, the F7U, for initial flight tests at the Naval Air Test Center, Patuxent, Md. The new Vought fighter is designed for transonic speeds and features a tailless configuration with vertical fins at the wing tips. Its performance is expected to be in a class with the USAF's North American F-86 jet.

North American will drop the B model in its F-86 series and put out virtually a new airplane of vastly superior performance as the F-86C. Among other things, the F-86C will have more power than the F-86B, static thrust (dry) delivered in the F-86A by General Electric's J-47 jet engine. USAF has already ordered 118 F-86Cs from North American.

Navy has cancelled its experimental contract with Chase Vought on the F7U "Flying Panther" designed by Charles Zimmerman to combine high cruising speed with the ability to hover for use as a Navy shipboard rescue plane. The V-173, prototype of the F7U, was flown successfully but failed sufficiently great ability to hover. F7U went through two tests but was never flown. Zimmerman left Vought recently to open his own consulting business in New York.

Northrop's X-4 tailless supersonic type high speed research plane, is now at USAF's Muroc test center for initial flight tests. Although included in the USAF classification for supersonic research planes, the X-4 will actually be used to investigate flying wing type configurations at high subsonic speeds.

Douglas is working on the third type in its Skyward attack plane series for the Navy. The AD-3 will be powered by a Wright 2600 turbojet engine.

General's radically designed flying jet model now at Muroc, erroneously called the prototype of the XF-92 by an online trade duty, is actually a research plane for a series of supersonic flights planned by General. It has neither the size, power nor configuration eventually planned for the XF-92. Most interesting feature now planned for the XF-92 is an Oerlikon-driven on the nose.

Bell Aircraft Corp. is quickly flight testing its new experimental helicopter the XB-14. USAF has ordered three models. Powered by a Continental XA-400 engine developing 275-cph, nitrocellulose power, the XB-14 weighs 2700 lb., has a top speed of over 160 mph, service ceiling of 20,000 ft., and a combat radius of 100 miles.

Low-speed stall in a tight landing approach has evidently caused the crash of the third Lockheed TP-90C, just short of the runway at March Air Force Base, Van Nuys, Calif., Sept. 9. Capt. James Pitt-Gardner, Air Force supersonic pilot (Airman Week June 21, 1948), was fatally injured. Although the aircraft showed off one wing and cartwheelled, the cockpit was undamaged and Pitt-Gardner's head injuries were said to be fatal. He was apparently held to tighten his shoulder straps before attempting the landing.

War planes inventors continue to provide North American with a portion of its military income. At the company's Downey, Calif., plant, 30 AT-6 trainers are being reconditioned for the Argentine Navy. Air men made on the assembly line, an additional 42 will be reconditioned for the Spanish Royal Air Force and Spanish Navy.

Douglas Aircraft's final five DC-4s now are on the production line at Santa Monica, meeting completion and scheduled for delivery to Delta Airlines with further entry in October. Prototype of the DC 4A, Douglas' largest four-engine cargo model will follow.

Consolidated Vehicle is optimistic over the sales effort that the first freight delivery of a Custom-Liner will have. From Melbourne last week came an enthusiastic Texas Airlines share order for delivery of the C-1, flight and route test of 17,923 mi. completed in 80 flight hours. The C-1, according to TAA, "exceeded all expectations and arrived two days ahead of schedule."



MCDONNELL'S XF-88. Note tail veins (dark lines) near wing tips, one on left wing pointing through intake.

## New High Speed Planes For USAF

By Robert Holt

Two new fighters and a new research plane have been awarded officially by the U. S. Air Force.

They were:

- **McDonnell's XF-88**, a sweeping, two-seat prototype fighter capable of supersonic speeds.
  - **Northrop's XF-48**, a leaner (30,000 lb.) straight wing, two jet engine fighter.
  - **Northrop's X-4**, a sweeping, two jet research plane designed to explore stability and control problems of indeterminate aircraft at high subsonic speeds.
- Evidence of these planes was not seen in *Aviation Week* readers. The XF-88 and XF-48 were described initially in *Aviation Week* of July 15, 1967. First sightings of the X-4 was in the first issue of *Aviation Week* July 7, 1967.
- **Supersonic Fighter**—The McDonnell XF-88 is one of the fastest if not the

fastest—fighter to appear in the slowly expanding USAF stable of supersonic fighters. Powered by a pair of late version Westinghouse J4C (J-30) jet engines along centrally on the fuselage below the wing, the XF-88 has a top speed ranging from better than 720 mph to more than 740 mph depending on various engine configurations.

Other XF-88 features include a phenomenal rate of climb (more than twice that of an F-80), considerably more range than U. S. jet fighters now flying, and heavier armament than any previous USAF fighter. The XF-88 will also carry external ordnance and bomb load for use as an attack plane.

► **35 Degree Sweepback**—XF-88 has a sweepback of approximately 40 ft. Wings and tail surfaces are swept back at an angle of 35 deg. Staff boxes are located near the wing tips to prevent spurious flow of air. Fuselage is 55 ft. long with a plastic cone for communications equip-

ment. Flash antennas are located in the cockpit canopy and the top of the swept-back vertical fin.

Forward cockpit is also equipped with a pilot ejection seat. Fuelage five bodies are located aft of the wing. Air intakes for the jet engines are in the leading edge of the wing roots. Underneath the fuselage curves upward behind the wing to expose the two tail pipes of the jet engines and provide a clear field for three Mast Goni weights at 15,000 lb.

► **Lockheed F-90 Next-Next USAF** entry on the supersonic stage will be the Lockheed F-90, which is a strong competition after several basic design changes.

The Northrop XF-90 is a straight wing all weather fighter built in competition with the Curtiss-Wright F-87. The XF-90, while only slightly larger than the XF-88, is nearly twice as heavy—40,000 lb. This is reflected in its



NORTHROP'S XF-48. Great weight (30,000 lb.) calls for large main wheels and double nose wheels.

large main wheels and double nose-wheel of its tractor gear. Most of the extra weight comes from intake, extra crewman and other night fighting gear.

- **Twist Jets**—The XF-48 is powered by two General Electric Alusen J-35 jet engines along symmetrically from the lower fuselage. Wing span is about 50 ft. Fuelage is approximately 50 ft.

Top speed of the XF-48 is well over 550 mph. First test flight was made at Muroc on Aug. 16. Northrop test pilots Max Sholes and Fred Betscher made the initial flight tests on the XF-48 with USAF pilots taking over recently. Two men crew including pilot and radar operator sit tandem in the pressurized cockpit. Both have ejection seats.

► **Research Plane**—The Northrop X-4 research plane is part of the joint NACA-USAF Navy high speed flight research program that includes the Bell X-4 and X-5 and the Douglas D-558 series. It is powered by two Westinghouse J35C (J-31) jet engines located on each side of the fuselage. The X-4 uses the elevator developed by Northrop on its flying wing type aircraft for altitude and elevator control. It has no han-



NORTHROP'S X-4. The in photo of mock-up. Actual plane is built and at Muroc.

damental tail surfaces but does have a prominent vertical fin.

This research plane was designed to test stability and control characteristics of a delta type aircraft at close to sonic speed. Navy study has a hybrid jet fighter type (the Vought F7U) of roughly similar configuration ready for flight tests (Aviation Week, Sept. 31). The F7U has vertical fin at the wing tips instead of at the rear of the fuselage as on the X-4.

The X-4 is about 30 ft. long, has a 25 ft. wingspan and a gross weight of 7000 lb.

► **Parasite Ready**—Meanwhile, McDonnell's XF-85 jet parasite fighter was ready to assume flight tests at Muroc after its nearly-dramatic initial attempt to gain the Boeing B-57D weather plane in flight. First flight of 10 minutes was made on Aug. 25 at Muroc. It ended, after an abortive attempt to engage the mother plane's tractor, in a belly land-



NF-16 PARASITE is lowered on trapeze from belly of B-29 mother ship.



... and even home for fast flight. Failing to reengage trapeze, it needs belly landing.

at 175 mph (Aviation Week, Sept. 30).

Among the contributing causes to the usual failure to engage the B-29 trapeze were turbulence on at 23,000 ft and a tendency of the stable 1-16 fighter to wobble. It was while the NF-16 pilot was fighting the heavy shock waves encountered by trying to maintain lateral stability that the B-29 trapeze balked in the parasite's company and Lt. McDonnell test pilot Ed Shook.

A B-29 is being used for initial test flights of the NF-16 because there are no Convair B-36s available with bomb bays equipped to handle the parasite. The parasite is carried internally to the modified B-29 loads bay and lowered on a stanchion trapeze for mid-air launch-

ing. Recovery is supposed to be made on the extended trapeze, after which the parasite is withdrawn back into the bomb bay.

The NF-16 has a top speed of about 600 mph, and has an extremely high turning radius.

#### New Parcel Post Points

The Post Office Department has an expanded air parcel post service to Australia, China, Fiji Islands, Hong Kong, New Zealand, the Philippines, Singapore, and Leningrad. Service is to 20 countries in South and Central America and the Caribbean area was started by the Post Office Department a few days earlier.

## More Orders

Remaining 1949 USAF funds being cleared to buy another 313 planes.

Fiscal allocations of its fiscal 1949 aircraft procurement funds was made by the U. S. Air Force last week.

Last chunk of the \$1,917,000,000 voted by Congress for new Air Force planes was the \$96,000,000 (Aviation Week, Sept. 28) approved last week by Defense Secretary James V. Forrestal and sent on to Ford's Office for final modification. Last week Mr. Truman certified another fund of \$109,000,000 previously approved by Forrestal for the purchase of 513 USAF planes.

The final \$96,000,000 will be spent for:

- Boeing B-47, six jet, swept wing bombers. Initial contract of \$45,000,000 will be for 18 bombers to begin production at Boeing's No. 2 Wichita plant. Boeing expects to break its Wichita employment to 15,000 early in 1950 to handle B-47 production.
- Northrop will get a three-bid contract on its present order for 32 transport under C-121F annual transports.
- Cessna will come into the USAF procurement picture; procurement program for the first time with the purchase of a number of Cessna model 151, four to five place executive plane powered by a 300 hp. Jacobs engine. This is an off the shelf purchase of stock models. Last price to private purchaser for the 1951 is \$14,000, the most expensive single engine small plane now in production.
- Shoney division of United Aircraft Corp. will get an order for more HIG four place scout helicopters.
- Kellett's XH-19 twin engine transport helicopter will go into production under the final USAF allocation. Due to unavailability of the Kellett Corp. under the Federal Aviation Act 4 has not yet been determined who will make the H-19. Kellett built the experimental model which successfully completed its flight test program. (Hughes Aircraft Co., Buena Vista, Calif. and Taylor Co., Inc., Chicago, Ill.)

Even contractors for the XH-19 production contract. About \$38,000 of the \$96,000 allocation will be used to buy a new USAF transport to be used to eliminate the C-121. Convair's Martin has been the leading contender for this contract with modified version of their twin engine commercial transport. USAF has not yet made a decision of whether the new plane or the Convair was to be purchased as the T-29. However both companies will be involved.

training version of the T-29 will be ordered.

• More Douglas-Additional pocket number production will account for another \$16,000,000 in the final allocation.

Forrestal's approval of the \$96,000,000 given the USAF funds for all of the 2737 planes originally authorized by Congress. Initial approval was given in June for allocating funds for 2231 planes, followed by approval for 513 more only in September with the final 311 approved last week.

Navy will plan to submit its requests for use of approximately \$200,000 of its fiscal 1949 procurement funds not yet allocated to Forrestal's office late this month.

## Material Command Completes Study

An Materiel Command has completed a 10-year expansion program study designed to modernize materiel and development facilities and to create new laboratories required for special projects.

Although the extent of the program will hinge on the availability of funds, Air Force has already included funds for the following in its fiscal 1950 budget requests:

- New Laboratories—Climate projects laboratory for high and low and cold weather testing at special equipment to be located in the northernmost mountain region, a solar research laboratory to be located in the southern desert region, a new electronics flight laboratory, an upper air sounding station and a cold-weather tropic wind for helicopter test cells, all in Alaska, and a new magnet test facility to be located in California.

• Wright-Patterson Air Force Base—Kaiser plans to abandon this outfit from expense overhauled with additional construction started in 1949-50 completion. New buildings planned for early completion include a photo research and processing laboratory, new quarters for the Air Force Institute of Technology, a rotary-wing training facility, a flight test facility for the new research laboratory, a storage building in the 10th wind tunnel, a high-powered direct radio wind rig, a rocket test facility, a weight and balance hanger, two VVIB (very, very heavy launch) hangers, and a VVIB shop alongside the new 10,000-ft., 39-ft. wide runway.

• General modernization and additional housing would be provided at Clinton County Air Force Base, Wilmington, Ohio, and Kelly Air Force Base, San Antonio, Texas.



Active plane "steep" F-86A during record landing flight at Meacham.

## F-86A Sets World Speed Record

Same plane, same pilot that scored near miss at Cleveland exceed 670 m.p.h. with speed to spare.

On its second attempt within the month, the U. S. Air Force engaged the world air speed record from the machine with a 670.981 mph performance in the North American F-86A at Meacham, Calif. Force record of 450.795 mph was held by marine Major Marion R. Carl during a Douglas D-558-1 research plane.

USAF used the same plane (16th F-86A off the line), and the same pilot (Major Richard L. Johnson of the Wright Field Flight Test Section) involved in the earlier attempt at Cleveland. On Sept. 5 Johnson set an unofficial mark of 669.45 mph, before being grounded at the National Air Race.

National Aeronautics Association officials denied published reports of a 674 mph mark at Cleveland pointing out that that figure was arrived at by averaging the last five runs after data by using the officially calibrated five records.

• Confirms Prediction—Major Johnson's record flight at Meacham on Sept. 15 was the first time a World speed record published Sept. 15 that the USAF would soon make another record attempt with the F-86 at Meacham.

The first record run at Meacham was made on June 15, 1946 when Col. Albert Boyd flew a Lockheed P-38 jet fighter at Meacham averaging 633.6 mph. This returned the speed record to the United States for the first time in 24 years.

On Aug. 23 of the same year Lieut. Col. Vance Caldwell of the Navy broke Boyd's record with a 640.7 mph performance at Meacham in the Douglas D-558-1 only to be topped two days later by Maj. Gifford 659.706 mph flight in the same plane.

and full instrumentation load. The run in contrast to the D-558-1 which is a research aircraft and carried no military load.

The record flight was timed under the supervision of Charles S. Langdon, chief of the current Bureau of NAA, with John Brown, of the Royal New Club, as Fédération Aéronautique Internationale observer. The results will be sent to FAI headquarters in Paris for headquarters.

Maj. Johnson and his Meacham run were much easier than his Cleveland performance due to a better marked course, better visibility (15 to 20 miles) and no other air traffic. At Cleveland Johnson narrowly missed an American lightplane and flew over the recording circuit on one run making it impossible to photograph his plane and record the final accurate position needed for an official record.

• Better Score Possible—"At no time during the Meacham run was I forced to exceed the 670," Maj. Johnson said. "At no time did I approach the maximum capabilities of the plane."

Now the pilot has reported exceeding 700 mph in level flight with the F-86A and performance of 690 mph are closed in sight.

USAF lost out a world speed record on June 15, 1946 when Col. Albert Boyd flew a Lockheed P-38 jet fighter at Meacham averaging 633.6 mph. This returned the speed record to the United States for the first time in 24 years.

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## U. K. Defenses

### Jet fighter output to be doubled, work pushed on new bomber types.

McGraw-Hill World News

- LONDON—Britain is taking several big steps to strengthen her defenses. Preliminary measures to be undertaken immediately are:
- Accelerating production of all kinds of military equipment, especially fighter aircraft.
  - Increasing the strength of the three forces.
  - Speeding up civil defense preparations.

The whole emphasis is on greater production of the British Isles as a key defense business—rather than a variety of measures to reinforcement needed for an offensive. This is clear from the mass placed on air defense units. In this light, the full-scale re-equipment of these divisions, begun on the weekend of Sept. 14, assumes even greater significance.

At present all of the forces are relying too heavily on wartime surplus stock. Supplementary replacement (also) will be forthcoming, but there is not yet a guarantee of the amount of civilian manpower that will have to be diverted to the increased production.

• **New Fighters**—Fighter fighters and bombers are being studied. Gloster and Hawker each are known to have at least one new jet fighter for the RAF well along; Pampy is understood to be studying a new Navy fighter; and Blackburn is nearly ready to fly a Nord turbo-propelled transport bomber.

English Electric Co. has been working for three and six-month versions of a new medium bomber expected to fly by early in 1949. Its speed is expected to be more than 500 mph, or twice the speed of the Lincoln, the present RAF standard bomber. Also in the bomber field, Vickers Armstrong and Bristol each have been working on long-range four-engine bombers capable of more than 600 mph.

• **Non Fighters**—Under the rebuilding program, output of "other types of fighter planes" is to be doubled. This clearly means the gyrocopterized Vampires and Meteors, which are the only types of fighters now in quantity production, although the Vickers Supermarine Attacker has been recently loaned abroad in a small quantity.

Doubling fighter production, however, doesn't mean doubling the size of the fighter command. The home-based command is to be fully equipped with Vampires as they are produced; production of these types will not

fighter squadrons overseas as well as Royal Auxiliary Air Force squadrons at home.

• **Five-Fifty**—Making of the new-sized fighter will go partly to build up air force strength, and partly to supply friendly foreign countries. Some will go to France and The Netherlands, which are now using British aircraft.

This may mean that Holland will get some new Fawcett Fighters (they are still in limited production), which has navy already in use. France, whose air force was rebuilt almost entirely around surplus British Spitfires, Mustangs and Lancaster, may get some Mustangs for operations from the night carrier that has been loaned to her by the Royal Navy Auxiliary command of Britain's foreign program is a first order from Sweden for Mustangs.

Britain's reserve strength is being increased by production of new fighters and bombers by factory re-equipment and modernization of the latest models of Spitfires, Mustangs, Hornets and Lancasters (new things). The pace of starting off and modernizing these plants will be stepped up.

• **Reinforced Strength**—Desensitization of Western Service units (allies) also will be stepped up due to the change in the next few months is to be delayed an additional three months. This will add 60,000 men to the forces at the end of this year, making a total of about 335,000.

Reinforcing of men and weapons for both the Regular and the Auxiliary Forces is to be further accelerated. The RAF has extended the scope of its drive for voluntary volunteers for service to start from next fall. Now, for the first time since the end of the war, its lists are open for candidates for service in aviation, engineers and ground (points and maintenance) men. The new strength for several months past. Simultaneously the Admiralty envisaged a rearmament scheme broadly similar to the RAF's, for naval aviation units and engineers (points and maintenance) men. The new strength for several months past. Simultaneously the Admiralty envisaged a rearmament scheme broadly similar to the RAF's, for naval aviation units and engineers (points and maintenance) men.

• **Reserve Needs**—The most important need is for 27,000 new men and women (roughly one-half each) for RANAF to use as a defense reserve. This new unit will be added to the existing 18 New RANAF units. 10,000 men and women (roughly one-half each) for RANAF to use as a defense reserve. This new unit will be added to the existing 18 New RANAF units. 10,000 men and women (roughly one-half each) for RANAF to use as a defense reserve. This new unit will be added to the existing 18 New RANAF units.

Also needed are 20,000 men and women in the voluntary part-time training service and 17,000 ground

crew, men in 20 different trades and women for the first time in ten trades. An intensive drive for both the Royal Air Force and the Territorial Army (who men Britain's main anti-aircraft defense) is to be started the first week in October, as already announced in a broadcast last month by War Secretary Ernest Brown.

### Cessna Leads for August

Great Aircraft Company's 145 hp model 173 led four-place airplane sales for the second straight month in August, according to company figures. 11 companies received the Personal Airplane Council.

Of a total of 438 four-place August sales reported, the model 173 accounted for 133 while Cessna's new sold one of its larger 190s and 34 model 175s.

August drop in two and three-place plane sales to 152 affected the Votaw "Stomacher" sharp drop of flight training for CAs at regional levels. Stomacher received four or four-place sales for the first eight months of this year, but Cessna had a total of 548 four and five-place, sold to the more eight months and was moving up to challenge the leadership.

Total August shipments of 860 planes with total dollar value of \$2,744,000 at the manufacturer's set selling prices, showed a drop from July shipments of 869 planes with total of \$3,319,000. Total shipments reported for the first eight months of this year are \$115 valued at \$29,941,000.

### TWA Traffic Outlook Good

TWA's late summer business held up well as both domestic and international mail, and the company forecast a stable outlook for the fall season on its trans Atlantic line.

The company reports that flights westbound from the British Isles and Europe have been held to capacity during the past few months. Although returning American requests account for some of the peak traffic, TWA says a large proportion consists of Europeans coming to the U. S. TWA's bookings, however, are heavy westbound.

Airline traffic volume through Oklahoma, Dorrington, TWA's passenger traffic during the second month of September was even better than the second best of the summer. Back to normal speed and the new 5 percent monthly discount probably accounted for much of the traffic increase. TWA also announced that during the first seven months of this year, freight volume was up 13.2 percent, as compared with an average nearly 5 percent over the same 1947 period.



Lockheed Airlift Service installation at MacArthur Field, L. I.

## Airlift Contract Goes to LAS

New USAF business not only boosts backlog, but may mark start of more high echelon maintenance work.

By Stanley L. Colbert

To Baltimore, (the point of C-54s going on the airlift route) like a million dollars. The Lockheed Airlift Service at MacArthur Field, L. I., the name of C-54s coming back from the airlift route, like a million and a half dollars—and that may be only a start.

The \$1,900,000 contract recently awarded by the Air Force to LAS for high echelon maintenance on ten C-54s in month is worth even more than that in its significance. The Air Force utilization of independent operators may mean a step towards replacement of a few maintenance contracts. The service should have a trained reserve of general maintenance facilities to expand in emergencies, in line with military or commercial.

Up to now, the Lockheed Airlift Co. and other independent operators have received only sporadic business from the Air. At its MacArthur, Calif., installation, which boasts 400,000 sq ft of hangar space and 600,000 sq ft of paved ramp, LAS has been quietly working long overhauls and shop orders on Navy aircraft of the C-54 and the Lockheed.

The MacArthur Field (Seyville) L. I., with a longer base, enough to accommodate five four engine transports and 50,000 sq ft of shop space, has been doing work for the Coast Guard. It also has general commercial con-

tract for airplane or equipment overhaul with Air Force, LAF (Voyager), Seaboard and Western, Air Am, Atlantic, Eastern, Prince de Borneo, KLM (Royal Dutch Airlines), and American Overseas Airlines.

In addition, a firm towards getting a maintenance on executive type aircraft has been paying off. An aircraft repair number of these planes have been coming in for general checks, overhauls and tanking.

• **Contract**—Lockheed Airlift Service's growth has been confirmed and accelerated.

In 1938, Lockheed Airlift Corp. established a parts and service depot in Ansonville, Holland. Its main purpose was to afford an accessible point to service Lockheed commercial or craft and in Europe. When war broke out, the depot was moved to England, and shifted to military work.

By VE Day, there were some Lockheed major overhaul bases employing 10,000 men overseas alone. More than 75 percent of the work was performed on other than Lockheed-made planes.

On Jan. 3, 1947, The Lockheed Airlift Service division became Lockheed Airlift Service, Inc., and from then on LAS has operated separately and independently of the parent company. • **First Year Figure**—First year figures: Jan. 1, 1947 to Jan. 1, 1948—were impressive. Personnel increased from 1000 to approximately 2150, more than 1-

705,000 work hours were performed on more than 500 transport aircraft. In June, 1947, the backlog was \$7,708,000.

This year, overhaul and tanking between have been looking up. In addition to contracted work with commercial airlines, LAS has dealt with British Overseas Aircraft Corp., TWA, Eastern Airlines, Trans Caribbean Airlines and the Flying Tiger Line.

• **Component Work**—LAS component shops field repair to many of its customers. Extensive facilities exist at MacArthur Field for overhaul of instruments, superchargers, hydraulic motors, dehydrators, pneumatic systems, and others. Barons has three facilities too, and both have repair on engine in component work.

While LAS' backlog is absorbed in the present company repair, it is known that the backlog is in the black. Employment is near 2100.

Meanwhile, LAS, as well as other maintenance organizations, has been trying to repair some of the present and possible enterprise the value of skilled, experienced and well-equipped establishments for heavy overhaul and maintenance beyond a new theater. Air has in the field with a new one operative now on the \$1,900,000 contract up start that operation, the door for additional high echelon maintenance may be open.

### New Helicopter Firm

A new entry into the Coast Guard Co. of America, Inc., is setting plant facilities in the New York City area to combine development and construction of a utility helicopter and a helicopter "Gyrocopter." Officers are at 2 West 41st Street, New York City.





## GOING UNDERGROUND FOR A "WHIRL"

► This seventh turbine wheel is about to undergo a "whirl test"—a test to prove its ability to survive the tremendous centrifugal forces generated while it spins at supersonic blade tip speeds.

► The test is conducted in an underground chamber from which the air is evacuated. This permits the wheel to whirl at higher speeds than required in service . . . for if the blades had to push air around at such speeds, enormous power would be required to drive the wheel. To detect any slight irregularities that might occur during the run, the test rig has an electronic indicator.

► Because some experimental parts are whirled to destruction to determine how much centrifugal force can endure, the chamber is filled with laminated lead plate—12 inches thick.

► Each newly designed turbine wheel, compressor, and supersonic injector must prove its ruggedness in similar tests in the Wright Aeronautical research laboratories before being released for production.

► Another example of the painstaking research behind the development of Wright aircraft turbine and reciprocating engines.



POWER FOR AIR PROGRESS

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CORP. OF NEW YORK

## ENGINEERING



High centrifuges at University of Southern California in seventh test to determine re-

sistance to G forces. An subject is whirled in coils, instruments record physical data help-

ing in understanding of how pilots may be prepared for rigors of high speed flight.

## Man Girds For Supersonic Role

Extensive research aims to insure pilot efficiency and survival in the hazardous realm of high speeds.

Engineers and scientists already have discovered enough about airframe and structures to build planes able to with stand the forces encountered in supersonic flight, but their next step may be just as hard. They have to find out more about how well man can stand high speed, high altitude flight.

► This is a new problem, one as complex as the human machine itself, and effort to solve it have produced a new type of modern medical tests. Probing those knowledge and techniques, scientists, engineers, designers, physiologists, plasticians, and pilots.

► They have determined that flight at high speeds is not itself injurious. But the extreme accelerations and decelerations that go with it, and the energies created by heat vibrations and noise, tax the physical capacities of pilots. In addition to this, man's mental processes are not capable of employing conventional methods fast enough to re-weight a plane traveling at 1000 mph or more.

► What's Needed—The scientists also know what direction their efforts must take.

► New practices just must be created so pilots can withstand high G-forces, and a handful new cockpit designs may be required.

► Refrigeration suits must be used to cool the cockpit against the extremely high outside temperatures, and heating must be available for after emergencies.

► The job of flying must be simplified, and pilots must be picked and trained more carefully than in the past.

► New methods of escape in emergencies will have to include an auxiliary propulsion method to prevent excessive deceleration, and pressurization features.

► Effects of sonic vibrations acting in flight must be investigated further. Brief case held that those can cause the pilot sick, disintegrate parts of his body, and destroy his mental powers is now discounted, but there may be other effects.

► Test Equipment—To approximate the conditions that will be encountered in supersonic flight, complicated experimental equipment has been built, and more is coming up.

At the University of California, men are withstanding extreme temperatures in a "hot-box" main their acceleration as to as much as 15 g's. F above the boiling point of water.

► New "pressure chambers" which men around at tremendous speeds at various altitudes throughout the country, and high altitude chambers subject them to actual strength.



The anti-Michael test for inflated bladder was designed to keep blood from boiling back.



This propped, upper-limbed, stainless steel device by R. F. Goodrich under military pressure has wings and communication pressure pipes in the torso of a single unit which can be disconnected quickly by the pilot in the event of emergency.

At Santa Fe, Long Beach, N. Y., the Navy is studying a "human angular acceleration device," to be used at the cockpit, in which man will be rotated on three axes at the same time to test the reaction of the delicate balancing mechanism in the inner ear.

At Wright Field, Ohio, the Air Force has built a five-field chamber, in which the effect of high frequency vibrations will be tested.

Study with such equipment and incidental exposures to the elements of aerospace environment have enabled researchers to gain the information that is used in the design of sophisticated high speed planes.

Information gathered by Science II-Infantry Magazine, a McGraw-Hill publication, shows what has been done so far in the study that will enable man to fly in a supersonic plane. The research borrows down to several categories.

#### G-Force

As a plane is subjected to high speed the pilot may be rotated against his seat.

If the engine would hit while he were flying at Mach 2.0 at low altitude he would be subjected to deceleration forces of 10 to 25 times the force of gravity.

In a crash, G-force may be as much as 40 to 50 times the pull of gravity.

How much of that can a pilot move? It is known that the tremendous forces of a crash, applied for only a very small fraction of a second, can be absorbed although they may cause brain contusion and internal lesions. A force of 25Gs for 1/10 sec. is not enough to make a pilot lose consciousness, and even brief periods of blackout are known to produce no permanent harm.

But in the case of sustained forces the picture is different. Leonard G. Meier of the Navy Special Development Center recently gave a very good description of the way in which these are felt by the pilot.

"Even when the pilot is experiencing only a 2G-force," he says, "there is a marked feeling of pressure as the air forced into his seat, and the extraneous movement is difficult to resist. Response time is increased accordingly."

"At 1 to 4Gs these sensations felt between are exaggerated, and great effort is required in order to resist the bending and twisting motions which are difficult to control."

"Between 5 and 8Gs there develops unconsciousness and coma, this state is preceded by blacking out of the field of vision, probably due to loss of blood from the head and face."

In supersonic flight, vibrations of unknown frequency may be encountered. According to Commander Louis S. Best, Jr. medical director at the Spa-

nd Deviant Center, forces of 4 to 8Gs may be expected from vibration and buffeting in the transonic range from Mach 0.8 to 1.5.

"Purpose of Centrifuge—To understand these forces completely, and to counteract them, researchers have to study the exact reactions of the human body. The general research task for this study is the human centrifuge. These animals and men are subjected to spin on forces under full medical conditions while continuously recording their blood pressure, X-ray internal organs, test reaction time, and keep a careful check on their general condition."

What they have found goes somewhat into an indication of what happens to the body under pressure. With positive Gs, results show that the blood is drawn from the head by gravity. When laid in a reclined, and relatively unconscious—blackout—state. At the same time internal organs are disturbed by the tremendous forces.

Negative Gs do exactly the opposite. Instead of drawing the blood down, they push great volumes of it into the head. At 4Gs the eyes are bloodshot, the face is swollen, and hemorrhages occur in the nose. The extreme of this is also unconsciousness or relief.

It was thought earlier that negative Gs would cause cerebral hemorrhages, but experiments so far show that the skull can't absorb enough pressure on the dura mater to prevent the vessels from bursting. Retinal hemorrhages, however,

may occur. In a series of experiments at Wright Field only one case of retinal hemorrhage occurred, and that in a monkey.

"Consider Movements—Beyond the basic reactions, centrifuge tests have given some clues for ways of combating the effects. Above all, G-tolerance depends greatly on the position of the pilot in the plane. He can take more pressure against his body than up and down.

Lying on his back, or stomach will help him withstand high centrifugal forces in a position (or a bag). For example, a seated pilot at 1500 mph would have to turn in a circle 13 sec. in diameter, and it would take him 21 sec. to do it. Lying prone he could turn in a 6 sec. circle and in 22 sec.

Protective gear, such as G-suits and anti-sedent belts, will give the pilot increased tolerance by mechanically preventing the blood from rushing to one end of the body. The inflated bladders of the G-suit put pressure on the vessels of the abdomen and legs, and raising it some 100 mm. Hg. will keep the blood from rushing down, they keep a man of it in the head.

"Don't Breathe—While practicing gear in the more subtle, the problem, tests have shown that it is influenced by many other factors. A corollary to risk neck or two grams of liquid blood, internal pressure increases, while high temperatures and high concentrations lower it. If the pilot could sit in a tub full of water he could also find an internal release."

One of the most important lines of protection is the pilot's mental attitude. "In an effort against, confidence will make the job easier and fear will only make the effort more."

Temperatures

In a supersonic plane flying at supersonic speeds would be at least 400 F. At the speed of 1000 mph, The National Advisory Committee for Aeronautics reports 180 F. in a plane flying at 1200 mph.

With such temperatures the first thing researchers have had to do is find out just how much a human being can stand. Older work, done in relation to tropical climates, showed that human beings at 50 percent humidity can stand 108 F., but recent experiments at the University of California show that people can withstand much higher temperatures than was previously believed.

"Test Bed"—Test—Under the direction of Dr. Cong E. Taylor, it was shown that men of most of the best of the best are mental for physiological stress tests. In his laboratory men up to 35 min. in a chamber, in "hot box," that was heated to 210 F. at 30 deg. above the boiling point of water.



In "hot-box" test, subject's reaction is observed and recorded at 210 F. in extended

The hot box is a metal chamber which is heated with heavy weight down. It is so rugged that but an can be passed through a water cooled control. It is equipped with an automatic oxygen flow by the subjects, and with all sorts of instruments that record temperatures at various parts of the body and keep a careful check on physiological functions.

With the help of researchers, direct observation, and the reaction of the subject, Dr. Taylor and his assistants are beginning to understand the way in which the body reacts to high temperatures. They found that at 180 F. and above, the body temperatures did not rise much above 100 F. and skin temperatures did not rise over 165 F.

At the temperature of the chamber goes up, the human body makes a frantic effort to cool itself. The subjects perspire profusely and in the process evaporate the body is enveloped in a layer of cool air. Evaporated, cooled by a normal process, was found to be 40 deg. below the temperature of that which was not cooled.

The subjects' faces reflected some of their effort, the heat, and they began to sweat right away. One subject, who spent 1 hr. and 39 min. at an average temperature of 170 F. lost 18 lb. by dehydration, and his pulse rose from 100 to 170. The pulse rate had to be stopped when after he left the hot box, and he gained back his weight in drinking water.

Vertical buffeting, at up to 4000 ft. in the transonic range, has been calculated to be as high as plus or

"How Does Pelt—The subjects say that their nose, ears and fingertips felt hot first. Then their cheeks and palms became warm, and a feeling of suffocation and discomfort followed. They couldn't see or hear very well, and some of them became nauseous. One seemed to be able to 'swim' but for several hours after the test. In the long run, however, all the subjects were more the worse for the experience."

A concentrated effort is now being made to measure the temperature of the blood in it with the help of this should lead to the determination of the exact blood temperature which can be tolerated without consciousness. Without this rate, the regulation will still be one of the most important factors of high speed flight.

Temperatures around the pilot will have to be kept well below the upper tolerance level, if he is to operate efficiently. Most experienced aviators do have trouble on reaching the whole cockpit. However, researchers at the aeromedical laboratory at Wright Field recently reported "satisfactory" tests of withstand clothing. As, paid through tubing to all parts of the body, and kept close to the skin by Nylon vests, give pilots control of temperatures ranging from 30 below zero to 180 F. after.

Vibrations

Vertical buffeting, at up to 4000 ft. in the transonic range, has been calculated to be as high as plus or





## Soup-or Duck Soup?

GCA\* makes the difference! Aviation's dread bogey—fog—has been scratched.

In 36 states, 15 foreign nations, nearly two hundred GCA-equipped airports now carry on routine transport operations in all weather. Pilots land 'insurance'... without incident.

An original manufacturer of the GCA radar landing system, Gilfillan has pioneered most of its refinements. Five-man, multi-scope trailer equipment has been engineered down to a trim one-man, two-scope unit in the control tower. Latest GCA self-powered military units are unenclosed, so transportable.

Outstanding new GCA feature is the ABEIL three-dimensional scope, which combines elevation, range and azimuth data. MTI (Moving Target Indicator) is another. Elevating all ground clutter, it gives sharp definition to every airborne aircraft within a 30-mile radius.

GCA means pilot assurance and passenger confidence. Helping the aviation industry to achieve dependable air transportation is Gilfillan's determined objective.

\*General Controlled Approach



**Gilfillan**  
LOS ANGELES

BEA International Division, New York, N. Y.  
Exclusive Export Distributor



1 Closeup of electrical connector installation being adjusted.



2 Graphite grease applied by projector in this test arrangement.

## Connector Provides High Safety

Electrical circuit functions after 30-min. exposure to 2100-F. flame. Cupro-nickel-tellurium contacts used.

By Charles J. Adams\*

Naval selection of materials has enabled an electrical firewall connector to withstand attack by fire and keep circuits operating for an extended period. This device—developed by Avionics Plastics Corp., Chicago—is an important addition to the growing list of aircraft safety equipment.

Effects of the burning flight test always presented an extremely difficult problem to the airplane designer and manufacturer.

The standard steel firewall provided a flame-check, but shifter, generator, propeller feathering, and other electrical devices required connection for power through the plane. If the fire penetrated long enough, the electrical connector (disappeared completely, leaving a hole with all the performance features of a blowtorch.

• **CAN Requirements.** To eliminate this hazard, the Civil Aeronautics Authority made a directive on firewall connectors and established performance standards. Requirements were short as follows:

• The connector must not permit fire to pass through the firewall for a minimum of 20 min when the engine side of the firewall is subjected to a flame of 2100 F.

• For the first 5 min of that 20-min period the connector shall maintain electrical continuity and be free from

any short circuit condition.

• All contacts must meet the preceding requirements and be capable of conducting the high currents involved.

The general outline of the connector possibly could have been varied considerably from existing types. However, a replacement of connectors now in use restricted the general design to one which permitted interchangeability.

Connector shells and fittings were not difficult to produce. Type 1020 BAF steel, cadmium plated, met the best requirements and was readily machinable.

Maintaining tight dimensions and thermal motion was the more significant standard. AN connectors, with added protection for safety wiring of coupling rings and fittings.

• **Insulation Material.** The insulating material posed a problem; most metal materials were unable to withstand the severe heat requirements.

Asbestos, in addition to its high resistance to absorption, disintegrates rapidly when oxidized and its strength is so low that adequate contact resistance could result in destruction of at least of the essential on separation of the connector.

All but a few of the ceramic materials were unsuitable to thermal shock. Zircon and cordierite were suitable and the latter was chosen because of its higher thermal shock resistance and lighter weight. Zircon's dielectric strength was not adequate and the small amount of powder found in cordierite was solidified by vacuum impregnating with a silicone resin.



3 View of test of firewall showing connector after test had proceeded for 15 min.

A desirable feature incorporated in the shells was the added protection given to the electrical contacts and wiring by extending the insulating material back and around the wiring. The perforated sheet strands of wire were shorting up adjacent conductors and give much more adequate surface contact distances between contacts and from contacts to shell.

Inserts were level in position in the connector shell to prevent accidental removal.

• **Contact Design.** The contact problem was most difficult to solve. Copper has high electrical conductivity, melts at about 1950 F, and has very poor weldability and mechanical properties.

Cupro-nickel alloys have lower electrical conductivity and lower melting points but possess the desired mechanical properties to resist contact resistance requirements.

On the theory that wiring on the cold side of the firewall could conduct heat

away from the contacts, protected by the ceramic, and because of the heat-hardening given in the surroundings, a cupro-nickel-tellurium alloy was chosen.

After subsequent tests have proven the theory for most sound this aspect. Incidence of solder in the alloy provides good mechanical properties to the contacts, and tellurium facilitates resintering.

The staking method of fastening contacts to wiring was chosen in preference to soldering because of the high temperatures which might be encountered in the event of a fire. For that wire reason, the contacts were silver plated so that, if the contacts became oxidized, current continuity would not be impaired.

After general design details were established, the Avionics Development Division of CAA's experimental station at Indianapolis was contacted. The proposed firewall connector was described and suggested refinements were noted.

• **Rigid Test.** These sample connectors were built, and one was tested by CAA's power load section located at Indiana jobs.

Fig. 1 shows the connector mounted on the standard steel firewall before the test. Fig. 2 depicts the test setup. Fig. 3 shows the connector at the end of the firewall after about 15 min. of the test time.

In the left background of Fig. 2 is seen a 100-amp generator supply power through the connector to a 14-hp, 240-volt, propeller feathering motor and oil pump. Generator frame and firewall were connected to detect any short circuits which might develop between connector shell and contacts or wiring.

Directly below the connector was a steel mesh flame package with a fire test of about 5 x 5 ft. Minimum temperature was 2100 F at the center of the flame and 1900 F near the edge with readings taken about one inch above the mesh.

A self-heating electric timing device was connected into the primary power circuit and set at three o'clock. The clock started automatically with the beginning of the test.

Timing procedure was prepared as follows: The connector was to be subjected to the flame for 20 min, and at the completion of each of the first 5 min fire prop feathering motor was to be operated for 20 sec.

After the first 5 min it was hurriedly disassembled to examine the 20-sec checks until electrical failure. After 16 min of this, the feathering motor was to be fired for extensive periods that it was decided to disassemble the electrical shells and examine with the three test only.

However, the prop feathering motor was operated for 30 sec at the end of the 20th and 36th min.

After 30 min of operation, it was believed that fire would not pass through the connector and, as the circuit had remained operative over as long as long as required, the test was discontinued.

• **Inspection.** After the connector had sufficiently cooled, it was disassembled for inspection. The shell was devoid of pitting, which apparently had been expected. Slight fouling of the cadmium plate in the connector threads was noted and made disassembly a little difficult. However, no fire or arcing would require replacement of the entire firewall, and that was not considered objectionable.

The contacts (main) were undamaged except for slight discoloration of the outer surface, apparently from the exposed oxidizing.

The contacts were in surprisingly good condition and appeared still serviceable. None of them, however, was touched by the wire pliers was limited to about the size of a shoe.

Apparently the heat conductivity of the wiring performed as calculated in cooling the contacts.

Although there have been other connectors developed that will stand high temperatures and prevent the passage of flame, this is believed to be the only connector which, in addition will also permit continued operation of the electrical circuit.



4 Reduction of exhaust noise.

It's claimed that one's hand can be rested without discomfort on the isobaric core during full power ground run up of the Swift's 125-hp Continental engine.

The silicon alloy, basically, a vacuum hole accepting iron from a small dust mounted in the nose wall. Exhaust eddies are reduced by a chamber fitted with a series of baffles actuated by an auto shutoff, and the gases are then driven by the vacuum exhaust system into a final exhaust duct.

Relative coolness of the exhaust would mean to give visibility to the aircraft's design that its silicon reduces exhaust back pressure.

Considering the weight of exhaust coating smeared from the Swift to make room for the silicon, the 3-lb device penetrates no actual weight compensation. In the Swift installation, two silencers are used, each carrying special pellets to impede flow in to cabin and exhaust heat-up systems.

A step toward application of Davi's principle to transport aircraft is seen in construction of a large unit, which is claimed to be tested by a 40-hp, Pratt and Whitney engine by Northrop Aircraft Inc., Burbank.

1932—is the product of Davi Aircraft Silencer Co., Croydon Airport, Croydon, Calif.

Concern over the aircraft noise problem, especially in residential areas, probably accounts for new interest in the Davi invention. Its uses have appeared as a number of light aircraft, but demand failed to warrant mass production.

Reports to AVIATION WEEK indicate a 60 percent reduction of overall sound in a silicon-equipped Swift. Swifts down at full power at 150-200 ft., in comparison with an unmodified Swift.

In CAA tests, climbing to 8000 ft. at full power with two passengers and 7.5 gal capacity, the silicon-equipped Swift showed an engine heat dissipation of 461 F. In a duplicate climb without silicon, heat temperature was 502 F.

In the maximum climb test a CAA aircraft involved a 13.4-deg increase in air temperature, as compared with results of a climb notes the silicon Davi, however, maintain that this was because of climbing altitude differences with silicon on the side cooler, with the test silencer installation. It claims that the silicon-equipped unit shows a definite lowering of oil heat in normal cruising flight.

Reduction of exhaust manifold heat is evident by touch at metal cooling of exhaust stacks and the final exhaust ducting. No exhaust flame is visible at night, and a temperature of only 215 F. has been recorded at the position of the exhaust eddies with the silicon installed.

It's claimed that one's hand can be rested without discomfort on the isobaric core during full power ground run up of the Swift's 125-hp Continental engine.

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## NEW AVIATION PRODUCTS

### Pressure Switch

Designed to stand high surge pressures and up to 50 G's of vibration, Hy-G pressure switch is adjustable for service use in sensing static inlet pressure, installed as circuit duct pressure, fuel and oil warning devices, aural or visual pressure, cabin lifting systems and similar pressure applications where rapid opening and differential adjustment are required. Designed by Hughes, Div., Cook Electric Co., Chicago, Ill., unit weighs less than 1 lb. and measures 4 1/2 x 1 1/2 x 1 1/2 in. Switch features pressure range from 100 to 1000 psi plus 150 F. shock operating pressure range can be varied from 0.1 to 100 psi to meet specifications.



### Three-way Air Meter

Line of built-in air velocity, air temperature and static pressure readings with Vanadium air meter mounted by Ingersoll Corp. of America, 100 West 90th St., New York City 16. Small probe is attached to long flexible cable, for easy access to areas. Air velocity is measured from 10 to 3000 fpm, temperature determined within 50 to 155 F. range. Static pressure is read directly in inches of water, from 0.5 to 10 positive and 0.5 to 4 negative. The unit weighs approximately 11 lb.



### Speeds Spring Testing

Improved load tester, Model 217F, is extended to higher speed and more accurate checking of coil spring. Designed by Hunter Precision Steel Co., Louisville, Pa., unit is easily adaptable to go, no go or frequency distribution techniques of statistical inspection. Handling loads up to 1 lb. and spring to lift up to 12 in., machine is suited to test 70 to 230 springs, with accuracy of one part in 2500 of compression load, or 14 to 60 in. All coiled spring load surfaces are replaceable, coiled spring prevents check damage and positive amplification means within 10 times. Dual indicator has 1 in. range with 100 graduation.



### Personal Radio Speaker

Designed for private radio listening through a pillow at head, cushion, miniature speaker provides clear audibility without disturbing others. Available to any radio or public address (PA) system, device is made by Telco.

### Removes Paint

By inhibiting evaporation, paint left made by Kellie Products, Inc., Box 2017 Torrance, Arroyo, Los Angeles 44, Calif., is intended to effect efficient penetration and removal of coating. Material is placed only on all surfaces, including aluminum and magnesium, and is stored in 2 1/2 in. dia. can. Co. is made, and can be removed, and contains no plastic components.

### Proportions Current Input

For laboratory and plant burning in atmospheric pressure circuit (input electronic) power controller is announced by Bend Co., Watertown 91, Conn. Practically straight-line temperature control is provided by three models of input energy. Average energy supplied is proportional to derivative of temperature from control point throughout load width, adjustable from 0 to 2 1/2% of full scale reading.



### Portable Rectifier

Intended primarily as power supply for stamping, testing, and operating in portable and conventional aircraft, type K24 500 F rectifier made by Mc-Corpen-Croft Co., 4923 Figueroa St., Los Angeles 37, Calif. With 12-plate silicon stack (high-purity lead), unit converts standard 5-phase ac into dc with less than 2% rms ripple voltage, even when no filter is used. Conversion rating is 500 amp at 25-40 db. and secondary load rating is over 1000 amp. Voltage stabilizer holds down from no load to full load within 10%. Rectifier can be furnished with up to 50 ft. of cable power, neatly attached, and operates in up to 500 ft. with cable reel. Reel power, rolling and pressure are made for two 60-lb. for extraneous.



### Synchro Units

Aircraft manufacturers are offered a new line of synchro units extended for electronic, electrohydraulic, and electrohydraulic control systems, as well as for remote control and indicating purposes. Available from Avco Corp., 244-15 St., Bayside 32, N. Y., line includes control transformers, motor, generator, and differential motor and generator. Systems are designed for operation from standard single phase 115V. 60 Hz supply line. Secondary can 90% maximum three wire system. Output windings at control transformers are suited to gradient of 10 per deg.

### New Face for Ring

Chromium-plated piston rings available from Williams Mfg. Co., Tulsa, Pa., feature anti-friction and lubricating characteristics and reduction of cylinder wear. Ring, constructed of special alloy, contoured out, and heat treated to produce dense, uniform structure with high tensile strength for top-groove action, it is to be safe from low-temperature brittleness, but is not subject to hydrocarbon embrittlement.



### Probes Troubles

Can Test sound scope, supplying 400 times, for detecting mechanical defects on structures and parts, is comprised of cathodes, transducers, aluminum probe and five dry cells. Reported to have application in testing bearings, etc. in aircraft wing, engine, control, device is made by Cuno-Tec Co., Inc., Road of Trade Bldg., Chicago, Ill.



The story of experience, passed through the war years, has been told many, many times. But the manufacturer who today goes on to design better equipment and develop specific applications, is a little more sure. The success story of Adels is based on precision manufacture of Hydraulic Equipment. This policy of producing only the best in quality and design is of tangible value to the Aircraft Industry today. For Adels provides a complete line of Precision Hydraulic Equipment for the planes now in production, and those being planned for tomorrow.

The Adels line of "3000 PSI" Precision Hydraulic Equipment. Shown here are a few "3000 PSI" units in Adels broad line of Hydraulic Equipment. This equipment offers greater power with substantial savings in weight. Its simple design provides ready servicing and quick assembly. Constructed of the highest quality materials, all parts are precisely made and carefully inspected. Built for long life and dependable operation.

Add Engineers are prepared to solve any specific application problems. Write today, for complete information on the Adels line of Precision Hydraulic Equipment for Aircraft.



Adels Precision Products Corp.  
BERKELEY, CALIFORNIA • HUNTINGTON WEST VIRGINIA  
Manufacturers of Aircraft Hydraulic Systems • Aircraft Valves • Line Support Clamps & Bands • Relief Valve Assembly • Pressure & Vacuum Indicators • Remote Controls • Hydraulic Hydraulic Equipment • Hydraulic Valves



Selector Valve, No. 16076—5000 psi. Solenoid Operated with normal size valve.



Relief Valve, No. 12188—5000 psi. 1/2" relief valve.



Hand Pump, No. 12041—5000 psi. Double acting hand pump.

General inquiry or available after below lead names. Please address requests to 11021 Fox Chase Drive, Berkeley, California.







## Simmons Stored at Detroit Pending Facility Move

Consolidated Walter has completed arrangements for delivery facilities for Stinson Voyager and Pyle Stinson Wagons at Willow Run Airport, Detroit, pending removal of Stinson manufacturing facilities to San Diego.

A sufficient quantity of the high-wing, four-place to six-place, six to ten seats for several months is stored at Willow Run, in the form of major assemblies which are being withdrawn for final assembly, flight test and delivery in accordance with dealer requirements.

An inventory of Stinson parts sufficient to last 12 to 18 months has been built up and is stored at the closed Stinson plant at Wayne. A small and well-stocked inventory is in the hands of delivery representatives in parts and is available for shipment delivery from nearby Willow Run.

Meanwhile, moving of personnel and equipment to San Diego from Wayne has started. Some experienced personnel, some equipment and prototypes of the 1949 Stinson have already been transferred.

Demand for the Stinson four-place which has led the field in volume sales for the entire postwar period, is continuing steady with the principal customers being farmers, mailmen, operators and business men, Coast reports.

## Type Approvals Speeded

Authorizations to issue type certificates for aircraft and associated parts from the regional CAA offices, to eliminate delays previously found when final decisions were referred to Washington, have been accelerated by CAA. Administrative Delta Restrictive Approval type certificate loads have eased simultaneous certification, permitting plans to expedite final type approval, pending Washington conference in two and a half years no significant discrepancies between field and Washington decisions have been noted, Reitel said.

## Federal Airport History

A two-volume legislative history of the Federal Airport Act has been issued by the Civil Aeronautics Administration and is available from the Government Printing Office, Wash., D. C., for \$4 per set.

Entitled "Legislative History of the Federal Airport Act," the publication makes available all the pertinent Congressional documents which evidence the intent of Congress in passing the act. Volume One has 155 pages and Volume Two 799 pages.

## BRIEFING FOR DEALERS & DISTRIBUTORS

**INTERNATIONAL TOURIST LANDING STRIPS**—Proposed to construct special landing strips on level places at or near highways which cross the U.S.-Canada border for convenience of lightplane tourist traffic which is expected to increase steadily within the next few years, was cited by George Burgess, Deputy CAA Administrator, in a talk at the Northwest Aviation Planning Council meeting at Vancouver, B. C.

These additional aerial gateways between the two countries would be able to use the same customs inspection personnel already stationed at the border on the highways for international motor traffic, and the convenience would help develop additional international travel by personal planes, he said.

**CROSLLEY INTEREST IN MOONEY PLANE**—Dugan, a special price release issued recently by the Crosley Corp., Cincinnati, on the fact that the Mooney M 15 one-place airplane was going into production using the Crosley C-60 engine, inspired by Aviatron Works has resulted in reply by a Crosley spokesman that the engine was designed to be no interest in the one-place other than to supply the engine.

**COMPARISONS BY BEECH**—Beech Aircraft Corp. has put out a letter to business owners backing up its aggressive campaign to show the advantages of the four-place aircraft plane and to switch some "unimproved" deliveries of the airplane. The letter lists comparisons of the three four-place airplanes with largest volume of sales.

Least flight load factor at full gross weight for the Stinson Voyager, Ryan Navion and the original Model 35 Bonanza are listed at the same, 3.8, while the Model A-15 Bonanza (which includes all Bonanzas after model No. 15004), is credited with a 4.8 least flight load factor at full gross. Likewise, the first three planes mentioned are all listed as having an ultimate flight load factor of gross weight at which failure may occur of 5.7, while the four-place Bonanza is credited with a factor of 6.6. The comparison points out that planned never-second dive speeds for the original Model 35 Bonanza and the new A-15 Bonanza are 202 mph. as against 190 mph. for the Navion and 181 mph. for the Stinson.

A performance comparison which shows the Bonanza is well ahead of the other two planes in fuel consumption, cruising speed, service ceiling, range, rate of climb, and short takeoff and landing distances over 50 ft. obstacle is included.

Figures for the comparison are taken from CAA approved flight manual or the equivalent manual published by each manufacturer for its own airplane. Furthermore, there has been little comparison of competing plans by the manufacturers, on paper at least. Most of the comparisons have been confined to cost statements or "allegations" by competing dealers and distributors. Jack Cary, Beech vice president and general manager, is issuing this letter may be starting a new trend as sharper competition between the manufacturers.

**FIRESTONE BARGAIN SALES**—Introduction of a series of bargain sales in the Firestone airport stores last summer has paid off in getting a number of the airport dealers in better financial condition through buying at new customers and balancing out inventories, the Firestone Tire & Rubber Co., Akron, reports.

The company now has more than 1000 store franchises scattered at airports throughout the continental U.S. and in Alaska and Hawaii. The sales were initiated after a survey showed that many of the store operators had suffered in the 1947-1948 winter season and that their capital was at low ebb and critically needed bolstering.

The sales, which cost prices as much as 50 percent on regular merchandise such as popovers, radios, vacuum cleaners and other things, more than doubled sales volumes of participating dealers and distributors, the home office states. Examples of individual volume sales include 108 pairs of new gloves sold by one distributor, 600 pairs of seat cushions sold by another, 30 popovers sold by one dealer, 25 vacuum cleaners sold by another.

—ALEXANDER MURPHY

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During the last war, Hindustan Aircraft was engaged in servicing and overhaul of fighters, bombers and cargo planes for the US Army Air Forces. The only factory of its kind in the Middle East, its contribution to victory has been praised by warriors of all Allied Nations.

### 100th Conversion

Immediately after the war, our Aeronautical Engineers completed a design for passenger conversion of wartime C-47 "Dakotas". Our designs were accepted by the great airline operators throughout India. We have just delivered the 100th converted plane—a VIP job for the Maharajahs of Darbhanga.

This factory is fully equipped, not only for Dakota conversions but also for overhaul of airframe, engines, propellers and accessories.

Write today for quotations, giving full particulars of your requirements.

**AUTHORIZED "DOUGLAS" DC-3 SERVICE**

# THE SUPERMARINE 'ATTACKER'

## Outstanding British Fighter

Recent performances of the Vickers Supermarine 'Attacker' have confirmed it to be the World's most outstanding fighter. The speed and general maneuverability of the 'Attacker' were amply demonstrated on February 27th of this year when carrying full military equipment, it covered the 1000-foot 100 Km Closed Circuit at an average speed of 561.8 m.p.h. Previously the 'Attacker' had carried out a series of successful dock landing trials on the Aircraft Carrier H.M.S. 'Blackburn'. These trials confirmed its inherent control characteristics under the low speed, wind-down necessary for dock approach. A failure or particular interest in this called upon to ensure it at present speeds in the cockpit vicinity from the cockpit.



'LANDING ON'

The ground flying characteristics of the Vickers Supermarine 'Attacker' in flight were also shown, when it landed from a carrier and back on an aerial carrier. With good control of a small airfield, the 'Attacker' is able to land on and operate.

RECORD BREAKER

On 27th February an 'Attacker' (No. 10) flew out of a new record for the closed circuit at 561.8 m.p.h. This was also the first time a Vickers Supermarine aircraft had flown at this speed.

IN THE AIR  
Such outstanding speed characteristics of the 'Attacker' were amply demonstrated on February 27th of this year when carrying full military equipment, it covered the 1000-foot 100 Km Closed Circuit at an average speed of 561.8 m.p.h. Previously the 'Attacker' had carried out a series of successful dock landing trials on the Aircraft Carrier H.M.S. 'Blackburn'.



VICKERS-ARMSTRONGS LTD-VICKERS HOUSE-BROADWAY-LONDON-ENGLAND

## AVIATION WORLD NEWS



### Rio Letter

## Money Troubles Hit Brazil Lines

Two companies suspend operations, others threatened as price cutting complicates financial situation.

**RIO DE JANEIRO**—Financial crisis has struck Brazilian airlines, forcing two companies to the wall and putting others on the ropes.

Navegao Aerea Brasileira grounded at their stable planes in mid-August. Although NAB had received plenty of help from the old Vargas dictatorship and even wrangled a subsidy four years in advance, aviation men say the company owes about \$2 million to the federal government, about \$11 million to other airlines and about \$100,000 to employees. NAB had been flying routes in southern and central Brazil.

Lufthansa Aerea Brasileira suspended operations in June without settling a financial statement for 1947, owing bills for several months. Its shareholders had long been rowing among themselves. There are no meetings on the firm, plans which had been flying LAF's routes in northern and central Brazil.

On the other hand, although both companies announced their suspensions as "temporary" measures, it is believed they did not expect NAB and LAF to come back. And it was a few years that airlines would fold.

Basic reasons for the crisis are:

1. Rates are the cause as in 1935, while expenses—especially fuel and wages—have practically tripled, and traffic has not increased in proportion.

2. The money lenders are cutting each other's throats to get business.

A third reason is some cases is bad administration, intentional for personal profit in some airlines, and merely self-interest in others.

► **Overload**—Paua do Brasil paid a 19 percent dividend for 1947 in the form of stock, increasing its capital from 80 million cruzeiros (\$4 million) to 93 million cruzeiros. A pool share of its income in five years rendered to the parent company, Pan American Airways, and to several European lines taking aid and weather facilities.

Paua do Brasil makes money on its European lines but couldn't cut on its Brazilian service. Now the U. S. Civil Aeronautics Board has reduced some charges in the Pan American Paua do Brasil agreement which may make a

difference in the income of Paua, in which Brazilians now have a 52 percent interest.

Companhia do Sul, which vies with Paua do Brasil as the country's largest airline, has the status of a leading company and does not have to pay dividends, its balance sheet that it is not having any more.

► **Case Pressed**—The company is paying its tax before CAB in Washington. The CAB authorities to begin flights to the U. S., long authorized in principle by a U. S. Brazilian agreement. For the service, Companhia do Sul acquired four DC-4s, but never have a deal it looking for a buyer for three of them and that a fourth is being sold to the U. S. by the Glenn L. Martin Co., which subcontracted the planes but still is waiting for payment.

Aeromarine Brazil reported it has paid about \$400,000 in 1947 and should no dividend.

Vasp, which operates only in the busy intensive route, showed about \$3.5 million in its mid-year statement in 1947. Its mid-1948 statement had not appeared late in August, but it was expected to be about the same.

► **Repsaid**—Vasp, a pioneer on the Rio-Sao Paulo run, reported about \$500,000 profits in 1947. Vastly owned by the Sao Paulo state government, Vasp gets considerable business from Paulista and does not avoid to maintain much in the way of special facilities.

Now partly as a result of these five airlines losing money when their service, Vasp is spending out somewhat and probably will be spending more money losing lines but it has not yet decided to help help it in the black.

In addition to those five airlines, considered the "big" ones, and the now-grounded NAB and LAF, there are some 20 other airline companies in Brazil. A few have regularly scheduled flights on some routes, but some scheduled, and several Vaps. Several show big deficits.

► **Wife-Night**—In the last few years, several fly-by-night airlines have tried to get for supposed money companies. For a while, the operators, who in-

vested nothing, would draw good salaries, put their relatives on the payroll and drive company automobiles.

Usually, the firm would acquire a plane or two. When the weekly "stop-go" at a bench of stockholders began to ask questions, they could be stalled for a time, perhaps the company would fold, with the investors losing their shirts. Only rarely had the report journal been stopped outside the law.

► **Paua Case**—Paua case cutting is every-day practice, although the companies agreed on price limits themselves and the government approved them. Now the lines have submitted their revised rate proposals, and the government is to fix selling prices. Anybody who wants to change rates is supposed to show he can do so in a way that will not harm the public. This will cost the airline companies some thing.

The prosperous Vasp company was one that wanted to reduce actual prices on the Rio-Sao Paulo run. Other airlines, including Paua do Brasil, which cut its Rio-Sao Paulo flights from five to three daily, usually lose in passenger payments on that run but other lines which make money by flying to other cities, which has more flights daily in both directions naturally carry a huge total.

The little fellows generally believe they can compete with the big ones only by underbidding them. Especially in landing flights, they also outpace the big companies.

► **Solution**—Sought—Most large companies operating over a big area pay passengers not to lose money. It is enough now to get practically all potential business, in other words, a major loss, unless it went to a reduction in fares, and would bring hardly any increase in use of the airlines. They agree that the little fellows, by cutting rates, are dragging the big ones down with them. The little fellows also share the big ones of underbidding.

There seems little disposition on the part of the government to force a new business of five more lines or to run a government monopoly airline. Now do the big airlines want to continue. Eventually, it looks as though most of the lines will be forced to quit, and that even then the government will have to subsidize the few remaining on all but the most intensive runs.

One probable, cynical suggestion has been to force all airlines—which probably will never get a public hearing—to let Brazilian companies get out of the business altogether and let the foreign lines do the flying here. The claim is that competition would be so keen among American, British, Dutch, French, Italian, Spanish and other companies that Brazilians would be sure to get good service, even though the competition might lose their own or the Brazilian money—Henry W. Bayley.

# AIR TRANSPORT

## Outlook Bright for Delta, Braniff

CAB retroactive mail pay adjustment plus new sliding scale rate improves profits prospects of two lines.

Braniff Airways and Delta Air Lines are again back on an even keel financially as a result of multi-million dollar mail pay adjustments offered the month by the Civil Aeronautics Board. In general, the new rates will yield the two carriers from three to four times as much domestic mail revenue during part and future periods as the fares previously in effect. CAB's decision gives Braniff and Delta the same improved profit outlook now enjoyed by Chicago & Southern Air Lines, which cut 1946-47 losses sharply and has been in the black this year as a result of rate revisions announced two months ago (AVIATION WEEK, July 19).

► **Income Offset**—CAB has offset Braniff's \$3,565,194 in additional revenue for the period from Nov. 1, 1946, to June 30, 1948. New rates which started Aug. 1 of this year are expected to yield about \$1,545,000 annually in excess of the tax provided in the premium formula.

Delta was awarded an additional \$907,426 for the period between Sept. 9, 1947, and Mar. 31, 1948. For the period which started last Aug. 1, the carrier is to have its mail pay increased by about \$1,911,800 annually.

CAB had little criticism of either

carrier for losses incurred during 1946 and 1947. On the contrary, it commended them for having the lowest unit operating costs among the group of certificated line carriers, receiving the 60 cents a ton mile rate.

► **Costs Compared**—During the year ended Mar. 31, 1948, Delta's expenses per available seat mile were 1.56 cents, Braniff 1.77 cents, Chicago 1.91, National 1.97, Chicago & Southern 4.68 and Western 4.17. The Board said Delta's management did not file for a mail pay increase until after it had made extensive efforts to curtail the carrier's operating losses without government support.

Under its former 60 cents a ton mile rate, Braniff received \$648,152 in mail pay between Nov. 1, 1946, and Mar. 31, 1948. The new formula increased the payment to \$1,212,806, equal to 149 cents a plane mile. The \$1,551,156 in additional mail pay will enable Braniff to show a 5 percent profit on its domestic investment during the 16-month period.

► **Incentive Formula**—Retroactive to Apr. 1, 1948, Braniff and Delta will be receiving a sliding scale retroactive mail rate formula similar to those already established by CAB for Chicago and Southern, Continental and several

others. Under this arrangement, the carrier must pay a agreed to their passenger load factor, with the mail rate declining as the passenger load increases.

The former 60 cents a ton mile mail pay would have yielded Braniff about \$179,000 for the year ending Apr. 1, 1948. The new rate is designed to give the carrier around \$2,083,000 annually, or about 17.7 cents a plane mile.

This rate at slightly under 17 percent of the standard passenger load factor at which Braniff can be expected to break even with the new formula.

► **Higher Profits Possible**—If the carrier could achieve a 70 percent passenger load factor, it would be able to earn almost 10 percent profit on its investment despite the discounted mail rate provided in the formula. Conversely, at the passenger load factor drops below 10 percent, the overall loss will increase, though mail pay cuts automatically.

Braniff's passenger traffic reached a peak around the middle of 1946 and has declined substantially since then. Load factors also fell. CAB decided that since Braniff had curtailed its schedule frequencies noticeably at the time, it should be given additional mail pay to help offset the unavailability factor.

In setting mail rates for the future, CAB said that Braniff's revenue passenger mileage should be on a par with 15 percent over the level of the year ended last June 30. CAB noted that Braniff's equipment utilization for the year ended last Mar. 31 was too low (67 hours daily against 73 for other carriers in its class). Consequently, the Board said Braniff had been operating two DC-3s in excess of requirements and reduced mail pay accordingly. It also refused to consider Braniff's incentive DC-5 as being necessary.

► **DC-6 Grounding**—Braniff's DC-6s were in regular service only a little over a week before the craft were grounded by the carrier last November. CAB found that because sufficient DC-6s attributable to the carrier's Latin American services were available at the time, Braniff was able to maintain to a substantial degree its volume of domestic operations and minimize the domestic impact of the DC-6 grounding.

The Board concluded that costs attributable to aircraft groundings must be taken into account when establishing mail rates. While these expenses are not predictable or measurable, they must be recognized as one of the costs of doing business, CAB said.

"These rules have been recognized by previous CAB decisions as a matter of course," CAB said, "but they have not been applied as fully as they should have."

Under the new formula, CAB said, Braniff's mail pay will be based on its passenger load factor, with the mail rate declining as the passenger load increases.

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► **Delta Assets**—Meanwhile, at the Delta and pay decision, CAB offered the carrier \$1,714,496, or 17.1 cents a plane mile, for the period between Sept. 9, 1947, and Mar. 31, 1948, giving it a 7 percent profit on its investment. Under the former 60 cents a ton mile rate, the carrier received \$130,071 for the period. The Board found that Delta's management had curtailed frequencies properly as the load fell off but did not decide that although load factors were low all of the scheduled passenger service provided was reasonably required.

Delta's incentive mail pay formula to be effective Apr. 1, 1948, should give the carrier about \$1,925,000, or 19.2 cents a plane mile, during a "year year." Under the previous scale, Delta would have received about \$154,000 annually.

► **Load Factor**—A standard passenger load factor of slightly under 60 percent, under the new formula, will enable Delta to break even.

If Delta should be able to boost its average load factor to 70 percent, it would earn more than 20 percent profit after taxes despite the discounted mail rate under the formula. But as the carrier's passenger load factor falls under 60 percent, losses will increase even though mail pay will rise.

In setting the "standard" passenger load factor, CAB figured 50 seats on a DC-4. Delta's DC-4s carry only 44 passengers, a number which the Board found may be too low.

## From Red to Black

Newly ended financial impacts reflect the sudden change from red to black ink which took place after CAB's new mail pay decisions.

Delta Air Lines President C. E. Woolman, announced his company would show an operating profit of \$175,000 and a net profit after taxes of \$218,000 for the fiscal year ending June 30 as a result of mail rate adjustments. Flatter profits are indicated for July and August.

Chicago & Southern Air Lines reported a net profit of \$791,590 after taxes for the fiscal year ended Aug. 31, Sidney A. Stowell, president, and international as well as domestic operations were in the black during August.



Sources—U.S. Department of Commerce index of retail prices; Bureau of Labor Statistics consumer price index; United Air Lines, Inc.

## AIR FARES VS. LIVING COSTS

The domestic airline industry is still getting a good run for its money despite the steadily eroding cost of life of the postwar period, according to a late study made by United Air Lines. The above chart, prepared by UAL, shows that one-way fares on new only 15 percent since the 1931 level and contrasted with a 70 percent increase in retail prices and a 63 percent rise in all living costs.

## Fare Boost Offset By Discount

The CAB-increased 10 percent passenger fare increase on domestic flights was completely offset by the discount for last week.

So confident had the picture become that Eastern Air Lines postponed indefinitely any tariff hikes. KLM, too, said it would not raise fares. Based on this, the CAB had planned to boost rates 10 percent across the board and erode the 5 percent retroactive discount recently made effective by other carriers which had lifted rates.

New Transportation Commissioner William F. Reiter's decision, however, that had raised rates on some of their services offered new retroactive discounts to passengers. TWA announced last between Nov. 1 and May 1, a would grant a 20 percent rate reduction for groups of ten or more passengers. All members of a group would not have to travel on the same TWA flight, but all transportation booked for any one group within the special fare must complete within a 24-hr. period.

Mid Continental Airlines said it would grant additional savings to "commuters" by extending full and origin business. Books of five to eight night commutes, good for 30 days, will be available at a 7 to 10 percent discount for travel between cities pairs of MCA cities.

► **Effective Oct. 15**—The regular carrier told the agency that PAA's new service was "merely second class . . . no luxury . . . no first-class . . . no jet-type seats." It called the travel agency's call a meeting to discuss some of the Pan American routes.

The scheduled operator, which has been flying from Boston, 314, and it would have four flights a week, one daily and seven by the end of the year. World Airways Executive Vice President J. Stuart Robertson indicated his company might offer a new \$93.50 one-way rate to Puerto Rico and make its berth available at \$10 cents.

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NEWEST FLYING DUTCHMAN

First of twelve Constellation ordered by KLM Royal Dutch Airlines left for Amsterdam this month where it will be used for cargo hauling and demonstration before going in service on the carrier's European routes.

new units. Now using about 120 seats and employing 12,000 persons, KLM says it will have the largest and most modern fleet operated by a foreign airline when all its Constables are on hand.

# IATA Analyzes Industry Problems

Brussels meeting warned against increasing government demands, bears expert discuss turboprop advantages.

Senior executives of the industry's increasingly complex financial problems, a call for low-cost narrow-gauge service to bolster revenues, and a forecast of what may be expected in the application of the gas turbine to commercial aircraft featured the major items discussed at a panel meeting of the International Air Transport Association at Brussels, Belgium.

IATA Director General Sir William P. Hildred warned that the world's transport system will be threatened with bankruptcy if governments continue to insist that international airlines pay lower charges of airport and other ground costs without helping the carriers to boost revenues. He stressed that the past year has been marred by a government tendency to reduce payments for carriage of mail in the face of soaring costs borne by the operators.

■ **Airport Costs**—Estimating that 1000 airports are used by scheduled airlines throughout the world, excluding Russia, Sir William pointed out that the annual cost of operating an airport, including depreciation, is about \$150,000,000, or one quarter of the annual revenues of all scheduled carriers. "If governments proceed on the basis of new figures and change accordingly, you can just top flying."

"Threats to the carrier's financial position broached in various government quarters recently have been ignored, the IATA executive declared. These demands include moves to increase flight times by attempting further reductions in flight time, possible barriers from the closure of older aircraft still operating without safety and economic changes at airlines for unnecessary aircraft and route operations, granting permission to non-scheduled operators to engage in air national commerce with greater freedom than scheduled airlines, and reduction of payload by increasingly strict aircraft weight requirements.

■ **Second-Class Service**—Sir William urged the carriers to take vigorous action in developing second class international service at lower rates in new routes of increasing revenues. Pan American Airways already has proposed such operations on its Puerto Rico runs (Aviation Week, Sept. 11 and 20).

He predicted that IATA members would fly less fullness, passenger miles in 1945 and increase their gross revenue 50 percent over 1947. IATA member state aircraft, of 500,000 miles and that of 1000 planes are about the same as in 1947.

■ **Worthwhile Spots**—Meanwhile, Sir William White, vice-president of the White gas turbine, told the 200 IATA delegates of the advantages they can expect when planes powered by turbine-driven propellers (turboprops) are widely for civil aviation use in the next five years. Even later planes powered by jet alone (jetprops) could be ready for the airlines even sooner, but they are not as economical to operate and maintenance has been slow in airport traffic landing methods, he declared.

Planes using turboprops could operate on schedules of 100 to 600 mph, while jet-driven aircraft could operate at speeds of 700 mph, the executive continued. He added that jet turbine power plants will give transports greater safety and control of related capital and operating costs in addition to the speed increase.

■ **Landing Problem**—"It is an airplane with gas turbine propellers has to cross around at low speed waiting its turn to land at a crowded airport, fuel can be saved by shortening down some airports and making the others of a higher grade."



FATHERSON TEAM

What actually would have been a steady income right from the Twin Cities to Chicago recently because a and then for North-west Airlines Capt. A. Fatherson, who has piloted up more than 12,000 hours since 1918. Coupled with Fatherson, a 42-year-old veteran of 28 years with NW, was his 18-year-old son Jim, making his first solo flight out for the record. The youngest Fatherson flight was in commercial service in 1918. Fatherson and his son took Northwest's training course to obtain the pilot's spot

portion of full power. But with a jet actually there is not much to be gained by this technique.

"Changes are going to place the airlines in a position to operate planes with jet power gas turbine almost at once for to be left behind and to prepare to operate jet aircraft when they are implemented and scheduled airlines in the field of airport traffic control have removed the necessity of waiting."

Manufacturing costs of gas turbine engines are considerably higher than they are, and, he said, because of the small number of units now in production and partly because manufacturing techniques are in the process of evolution, jet aircraft engines, he said, will be more expensive than the jet engines of gas turbine engines in quantity production will be very much less than half that of a reciprocating engine.

■ **Development Progress**—Discussing development limitations for gas turbines, the inventor stated that in general turboprops will take longer to develop than turboprops. Engines with most four compressors will take longer to develop than engines with centrifugal flow compressors. Yet despite the fact that the piston engine now in general use has had over 40 years of development while the gas turbine is only in its infancy—no one should get a gas turbine like anything like as long as a piston engine to develop.

"It is possible to derive a whole family of gas turbines of varying power capacity by adding up to three times as many already in existence," Sir Frank explained. "All gas turbine engines have the advantage of lower specific weight, small bulk and low maintenance costs, and they are 'clean' aircraft; complete absence of vibration, ability to run on low-grade fuel and hence reduced fuel, maintenance and supply, which increases reliability and reduces fuel cost and maintenance, negligible consumption of lubricating oil, negligible cooling requirements, and only starting, with very little oil as a starting oil."

■ **Engine Development**—Sir Frank outlined the characteristics of four turbine engines and seven turboprop engines now in use or under development on Great Britain as well as those of four jet engines and four turboprops.

Representatives of about 20 airlines from all parts of the world attended the Brussels meeting. At the opening session, Gilbert Peck, president of Sabena, took office at IATA president, according to Sir Frank. Peck is currently president of the British Airline Services Association Council of 20.

## New Local Service Asked for West Coast

Authorization of extensive new local service in the California-Nevada area has been agreed on CAAI despite recent warnings that most local airlines are reluctant to expand the domestic route pattern.

Executive F. Merritt Robles has recommended that CAAI certificate Southwest Airways for extension new westward routes to its Midland, Cal., Los Angeles route and toward extension of the link from Las Vegas to Phoenix, Ariz., via Long Beach, Ontario, Fresno, Riverside and San Bernardino. The extension would cover more than 1000 miles of Southwest's two-way route, and that the carrier will have five years of active operation to demonstrate its potentialities.

■ **Other Recommendations**—Bureau Air Lines, Las Vegas, Nev., was recommended for a five-year local certificate between Las Vegas and Midland, Or., via Dent, Calif.; Los Angeles, Hawthorne, Calif.; San Francisco, Calif.; and San Diego, Calif. Atlantic Air Transport, Inc., was invited for a link between Seattle, Canadian Island, and the trans-Pacific route, British and Canadian Airways, Ltd., was recommended for a stop at Reno as an intermediate point between San Francisco and Sacramento on the West Coast segment of Route 1.

## Airlines Reply to RFC

The Reconstruction Finance Corp.'s study of the air transport industry's economic problems in America (Aviation Week, Sept. 25) moved ahead last week to one of the 16 domestic airlines implicated in questionable pricing estimates of their financial records during the past 18 months.

Carriers were requested to state whether they believed all their financial requirements through Aug. 1, 1938, could be met from their own resources or from private sources. If it was found of proposed ticket, revenues and costs, the agencies anticipated difficulties in obtaining private financing, they were asked to submit detailed information to the agencies regarding their financial position, including a statement of their capital assets, short term obligations, other problems such as refinancing outstanding obligations or securing working capital, and restrictions on the use of assets other than those to support a condition which results in restricting a carrier previously permitted.

Excluded from the Board's powers of all authority to make certificate of public convenience and necessity is the study of the airline's financial

problems and to submit to President Truman its recommendations for their alleviation by the end of October.

## Air Travel Plan Stands

A new universal air travel plan which will enable passengers to buy their tickets in credit almost anywhere in the world will be put in operation Oct. 1 by agreement between international and domestic airlines.

Under the plan, the air traveler generally will be able to secure a credit card by making a deposit with any airline and can have the card honored for transportation by all other airlines.

## CAB Rules on Service Restriction

Board's Caribbean decision upholds right to control as well as expand authorizations; PAA flights involved.

A finding that the Civil Aeronautics Act gave the CAB authority to control as well as expand previous certificate authorizations highlighted a recent Board decision establishing new services in the Caribbean area.

CAI's important policy proposition stemmed from a relatively minor airport area—Caribbean Atlantic Airways' request that the Board modify Pan American Airways' certificate to prevent PAA from conducting to serve St. Thomas, Virgin Islands, on local flights from Puerto Rico.

Pan American claimed CAB lacked the power to impose such a restriction. It argued that Board action which imposed such a restriction by a certificate is a total or partial restriction of that certificate which can be accomplished only by an intentional failure of the certificate holder to comply with the provisions of the Civil Aeronautics Act or of the certificate itself.

■ **Panama-Caribbean**—CAI Chairman Joseph J. O'Connor, Jr., and Member John La Follette said that the Board had found no evidence that the carrier had a certificate, on grounds of public convenience and necessity, to avoid the route-to-territory and points not previously served, provided the extensive data and information of the carrier's financial position, including a statement of their capital assets, short term obligations, other problems such as refinancing outstanding obligations or securing working capital, and restrictions on the use of assets other than those to support a condition which results in restricting a carrier previously permitted.

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problems. Details of the plan follow those of the six local airlines now being added to North America.

Travelers can obtain credit cards from any participating airline by making a \$100 deposit. To conform with various national exchange controls, which will be issued in those countries. The first card was issued in North America, the West Indies, the Bahamas, Bermuda, Newfoundland and the Hawaiian Islands; international—pool for commercial general aviation, and commercial—good within the limitations prescribed by other countries on the amount of money their standards can spend on foreign travel.

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## NAL Strike

**Pilots try new strategy in effort to push dispute to victorious close.**

The Air Line Pilots Association has reinforced its efforts in bringing the eight-month-old strike against National Air Lines to a quick and victorious end. Current strategy is to help drive a wedge between the company's management and its stockholders.

National's refusal last July to accept a Professional Emergency Board's recommendations for settling the pilot contract was a hard blow to ALPA. When NAL made peace with the International Association of Machinists in accordance with the Emergency Board's findings, ALPA lost a partner in its fight against the carrier, and the one pilot's authorized operation was made easier by the actions of its regular ground personnel.

**Heavy Losses—While ALPA has its own financial troubles as the continued suspension of its working members for the support of the NAL strike, the union is asking the most of the company's heavy losses.** It has high hopes that there will be fireworks at National's next stockholders' meeting, scheduled for Miami, Sept. 30.

A stockholder's war was filed against NAL President G. T. Baker in Federal District court in New York five months, the charges being that the carrier is in "immediate danger of insolvency" and that its certificate to operate is in jeopardy. The complaint seeks appointment of a temporary and permanent receiver for National, an order requiring the defendant (Baker) to return more than \$1,000,000 to the company, and an order that the defendant be required to pay for all damages for alleged negligence.

Baker, who is National's principal stockholder, was accused of embezzling and controlling all officers and directors of the company. "In carrying out a policy of deliberate oppression of stockholders," NAL officials believe the act was perpetrated by ALPA.

But National's financial losses have been minor. For the fiscal year ended June 30 it reported a \$1,946,040 net deficit. During the first half of 1948 alone, the company had a \$1,049,465 net loss, most of which was incurred after the pilot strike began Feb. 5.

When NAL President Baker's wife, long reported to have fled to the South, was the first of that race, and the company has told CAB that a higher temporary rate and rate is urgently required if it is to continue to perform necessary service. Over the expense of ALPA, National was awarded higher

company mail pay last March. The company has been seeking a higher permanent rate retroactive to July, 1947, but believes that permanent compensation cannot be fixed in time to prevent a financial crisis.

Resolution that additional mail pay would bolster National's resistance against the strike is a major reason ALPA's stepped up drive for a decision. A CAB opinion on the union's request that NAL's certificate be suspended or revoked for violating the Railway Labor Act may take a year or more. The board has not yet decided whether to suspend the certificate in the latter.

Meanwhile, William Green, president of the American Federation of Labor, has asked President Truman to assign a representative to find out why National has refused to accept the findings of the Emergency Board. And ALPA is continuing its ground picketing and its writing activities to keep National traffic at a minimum.

## UAL Moves Maintenance

Centralized maintenance on United Air Lines' entire fleet of 147 planes at the company's new San Francisco base is under way with transfer of DC-3 overhead stage from Chicago, Wis.

Changes will transfer 900 employees to augment 1,700 at San Francisco.

### ATLANTIC SERVES



WILMINGTON DEL.

NEW YORK N.Y.

BALTIMORE MD.

BOSTON MASS.

Atlantic Servis

Plan Service on the East MASTER AIRCRAFT AND RADIO SERVICE NEXT TIME—STOP AT ATLANTIC

## Changes at Northwest

Northwest Airlines' reorganization program (ENR 9/22/48 p. 17) has brought a reshuffle in the number of corporate offices and assignment of responsibilities.

NWA President Carl Hunter announced the company's latest list of directors, has appointed the following changes: W. F. Marshall, vice president-operations, has resigned; K. B. Ferguson, vice president-engineering and planning, was named vice president-operations and engineering, taking over many of Marshall's duties.

Fourteen of executive vice president J. E. J. Whyatt, and the vice president of Eastern region vice president was discharged. Whyatt's new title will be vice president and controller. Donald J. King, who has been vice president in charge of United operations, will be in charge of that capacity by Jan. 1, resign the post and return to flying status.

## SHORTLINES

**✓ Air America—Has added CAB** for a certificate to carry passengers only between Los Angeles and New York and San Francisco and New York via routes on intermediate points. The Los Angeles, Calif., airport, which began operations last July, says it would like to have to provide aerial taxi, baggage, trucks, using DC-3s and DC-1s in charging \$700 for a transcontinental ticket.

**✓ American—Walter Stenberg, general sales manager, and G. R. Spitzer, eastern regional vice president, have been elected assistant vice presidents.** Walter H. Johnson, Jr., was appointed regional vice president in western region.

**✓ Capital—Increased cargo shipments** during August by 321 percent in dollar volume and 356 percent in package count. Flying last year and scheduled in all-time peak.

**✓ Flying Tiger Line—Has signed an** interline cargo agreement with KLM.

**✓ Northwest—Has announced plans** with Air France and KLM establishing new westward routes across the Atlantic from New York and Shanghai. Global fare via either the NWA-KLM or NWA-Air France bookup is \$1700.

**✓ Norwegian Air Lines (NAL)—Has** taken Captain Ragnvald Larsen as pilot in charge of the company's first jet, a four-engine Lockheed Constellation, on a flight to Seattle.

**✓ Panagra—This month celebrated its** 15th anniversary.

**✓ Pan American—Has set cargo rates** on shipments of \$50 to or more based from New Orleans, Houston, Croyon

Cherry and Brownsville to Mexico, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama. If the statute with the new \$50 15 volume rate is successful, it will be made effective on a world-wide basis. Passenger and cargo volume on Pacific routes increased 31 percent in July compared with the same month last year. CAB has authorized PAA to serve Santiago, Chile, and has issued a one-year exemption for service to Lisbon, Portugal, as an intermediate point between the Atlantic and Indian sea lanes to South Africa.

**✓ Philippine Air Lines—Has added** CAB permission to serve Guam on its trans-Pacific route.

**✓ Republic—Has added a second 3244** passenger jet in August. Service to Los Angeles, N. M., is to begin August 1.

In flight observations are now possible on all planes.

**✓ Trans-Canada—Will suspend service** Sept. 15 on its Fort William-Fort Arthur-Duluth line, because of lack of traffic.

**✓ United—Ninety-five percent of UAL's** flights departed within 15 minutes of scheduled time and 75 percent arrived within 15 minutes of schedule during August. Service to Bradford, Pa., has been suspended.

**✓ Wisconsin Central—Has added** CAB for a high and low, clearing its working capital, is being applied to supply under present rates that despite a possible Company had an operating loss of \$51,527 on a 26.62 percent load factor from July 15 to the end of month service. July 15, but expected a profit in August.

## CAB SCHEDULE

**Sept. 10—Hawthorn as Challenger Airlines** application to serve Trans. 17th and Center City, Pittsburgh from Sept. 17, Chicago 11:00 and 11:15.

**Sept. 10—QNT authorized in TACA, S. 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# EDITORIAL

## More Airlines Chop Fare Costs

Last week brought more winter excursion fares. Not content with a previous slash in winter passenger rates on the Atlantic and a second class coach rate on its New York-Paris-Rice run, Pan American Airways cut its seasonal fares would drop 35 percent on Alaskan service effective Oct. 15-Apr. 15.

With C. Lippincott, PAA vice president-traffic & sales, said: "In 1946 we reduced winter fares within Alaska on a roundtrip or excursion basis. In 1947, winter excursion rates were expanded to include Seattle. Now we are able to offer a 25 percent reduction within the territory, and to add from Seattle, that is valid on both one-way and roundtrip passage in both directions, and the period of winter reductions has been extended to 7 months."

Savings will be considerable. The new one-way ticket between Seattle and Fairbanks will be 50% against the present cost of \$150, while round trips will be \$175-40 instead of \$336.

Meanwhile, Eastern cancelled all plans to increase fares 10 percent. TWA returned its previous fare for Constellation but announced that between Nov. 1 and May 1 it would grant a 20 percent reduction for groups

of 10 or more travelers. Mid-Continent and books of four to eight flight coupons, good for 30 days between certain cities, will be sold this winter at 7 to 10 percent discount. American and the reaction given its new family-discount fares was better than expected. Other rate cuts have been fully reported in the two previous issues of *American Week*.

Few airlines expect substantial traffic this winter. Most of the reductions and adjustments are intended primarily to fill airplane seats rather than to make the companies a profit.

So far, although the non-scheduled passenger carriers are still hauling traffic coast to coast at fares close to \$100, no scheduled (intercontinental) airline has announced plans for instituting second-class service at competing air-coach rates.

An coach service is here, thanks to the pioneering non-scheduled carrier. It is American West's option that the public deserves at least long haul coach service, and will demand and use it, regardless of who offers it. Air transportation on the other hand, must have the benefits of mass passenger traffic or it will forever be a subsidized, government-controlled industry.

## How Not to Gain Sympathy

Two recent performances of the Air Line Pilots Association in their campaign against National Air Lines have fallen rather poorly on the public.

Last week Mrs. Joe Wain Rains, wife of the famous Brooklyn shortstop, chartered a National DC-6 as it started a daily New York-Miami flight to be called "The Brooklyn Dodger." Upstairs in the coach a skywriter tried to spell out "noah", and according to press reports, there were telephoned suggestions that the Dodger club cheer the coachmen. Meanwhile, pilots handed out the new famous match covers with their "advertising" phrase, "Don't fly National Airlines."

The other public relations hobble was the union's pressure in Miami Springs, Fla., which resulted in cancelling a welcoming luncheon for Johnny Johnson, who was the Thompson trophy at the National Air Races—because Johnson is flying for National. W. T. Babbitt, ALPA's Miami spokesman, was quoted as saying ALPA "will do everything in its power to prevent any official Greater Miami from greeting the so-called hero."

We agree with the Miami Daily News, which said editorially:

"Johnson has brought national publicity to the community and in addition has proved that he can do quite

a bit more than pilot a transport plane. What the ALPA thinks of Johnson as a National Air Lines employee is of little import. What does matter is the fact that Johnson has done something which merits respect. He has won as we saw against the top contender from all over the country. He has proved the ability of a Florida pilot and his place to remain the best. The tactics of the ALPA have not detracted from his accomplishment. But they have demonstrated the shallowness of the thinking of the leadership of the pilots association, and have properly brought down the wrath of a large segment of the community on the ill-tempered striking pilots."

This expression does not automatically label as pro-management or anti-union. We remind our ALPA friends that in the past we have been as quick to deplore industry tactics such as what appeared to us to be a dignified manager attitude toward the non-scheduled cargo and passenger carrier. We deplore such a frame of mind held by any group.

American aviation goes sportsmanship and fair play. If ALPA's case is just, ALPA will win out. It need not employ such petty tactics. Certainly, they will not win any new friends to its fold.

ROBERT H. WOOD

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is no longer than your thumb, but is dependable in performance

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# lower cost

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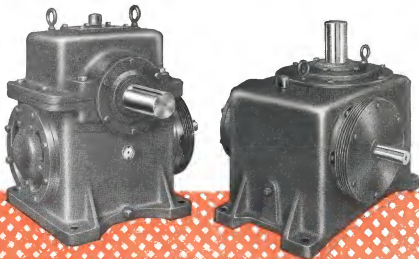
lurgical control of materials, improved manufacturing techniques, a revolutionary new method of generating gears, and a radically new design that incorporates an air channel cylinder through which passes a high velocity stream of cool air.

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